User:

Thursday, 29/05/2008 2:34:14 PM

Julie Lecocq

Process Sheet

Customer

: CU-DAR001 Dart Helicopters Services

Job Number : 39579

: 10559 **Estimate Number**

P.O. Number

This Issue

Prsht Rev.

First Issue

Previous Run

: 29/05/2008

: NC

: // : 39112

Type

S.O. No. :

: CROSSTUBES

Part Number

Drawing Name

: D412664203 - D412-664-243 REV D

: HIGH AFT X-TUBE 412

Drawing Number

: N/A

Project Number Drawing Revision

; D Material

: 10/06/2008

Qty:

1 Um:

Each

Written By

Checked & Approved By

Comment

Est Rev:G 06.12.08

Reformat; Added D3189-1 K/DS 06-03-29

Remove Coments on Pick List JLM

per ECN 886 Est Rev:H 07-04-30 As per Rev D

EC JLM

Due Date

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description: DOCUMENT CONTROL

DC 10

Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D412-664-203 CHG 006

PACKAGING 1 2.0

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1 D412664203TRN

CROSSTUBE TURNING DETAIL



Comment: Qty.: 1.0000 Each(s)/Unit Total:

BENDING

1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch_\$

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010

E28-6-5

5.0

3.0

QC15

DIMENSIONAL CHECK OF X-TUBES

08.06.05

Comment: DIMENSIONAL CHECK OF X-TUBES

79 D 412-664-203

Dart Ae	Aerospace Ltd						
W/O:		WORK ORDER					
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
						,	
			·				
Part No	:	PAR #: Fault Category:	NCR: Yes	No DQ	A:	_ Date: _	:
			QA:	N/C Close	d:	_ Date: _	
NCR:		WORK ORDER NON-CON	IFORMANCE (NC	R)			

NCR:		V	ORK ORDI	ER NON-CONFORMAN	CE (NCR)					
		Description of NC	Corrective Action Section B			Verification	Ammanal	A 1		
DATE	STEP	Section A In	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	Approval QC Inspector		
								·		
3										
26										
*										
*.										
		Ž								

Thursday, 29/05/2008 2:34:14 PM Date: User: Julie Lecocq **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 39579 Job Number: Description: Seq. #: **Machine Or Operation:** CROSSTUBES RESOURCE 1 CROSSTUBES 6.0 Comment: LANDING GEAR RESOURCE 1

Les Scribe B = c P/N on inner compar on the coff. 1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 2-Ream hole to finish size in tube as per Dwg D412-664-243using drill Jig DT8550 & DT8551.Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243 HAND FINISHING RESOURCE #1 HAND FINISHING1 7.0 14M 8-65 Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1 INSPECT POWDER COAT/CHEMICAL CONVERSION 8.0 Comment: INSPEC POWDER COAT/CHEMICAL CONVERSION INSPECT WORK TO CURRENT STEP 9.0 QC5 Comment: INSPECT WORK TO CURRENT STEP **OUTSIDE SERVICES -skids** 10.0 **OUTSIDE SERV.10** Comment: Sub-Contracting OUTSIDE SERVICES Liquid Penetrant Inspection as per QSI 038Or CLO8/06/09 (1) Issue P/O: 6525 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order PACKAGING RESOURCE #1 **PACKAGING 1** 11.0 Comment: PACKAGING RESOURCE #1 Inspect for transit damage Ensure copy of NDT results attached to work order.

Dart Ae	rospace	Ltd							
W/O:			WC	RK ORDER CHANGE	ES				
DATE	STEP	PRO	OCEDURE CHAI	NGE	Ву	Date Q	ty Approval Chief Eng / Prod Mgr	Approval QC Inspector	
Part No	:	PAR #:	Fault Cate	jory:	NCR: Yes	No DQA:_	Date: _		
					QA: N/	C Closed: _	Date: _		
NCR:		\	NORK ORDI	R NON-CONFORMA	NCE (NCR)			
		Description of NC		Corrective Action Section	n B	Verification	Annroyal	A	
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C		Approval QC Inspector	

DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	QC Inspector

Thursday, 29/05/2008 2:34:14 PM Date: User: → Julie Lecoca **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 39579 Job Number: Description: Seq. #: Machine Or Operation: INSPECT WORK TO CURRENT STEP QC5 12.0 08/06/10 Comment: Inspect for damage & ensure results are as per Dwg D412-664-203 SPRAY PAINTING SPRAY PAINTING 13.0 Comment: SPRAY PAINTING 1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 INSPECT SPRAY PAINT QC14 14.0 Comment: Inspect Spray Paint Wrap in plastic bag to protect from scratches RUBBER CUSHION D3595063570 15.0 4.0000 Each(s)/Unit Total: 4.0000 Each(s) Comment: Qty.: **Rubber Cushion** 08 06 12 Batch: D2856600 16.0 1.7640 f(s)/Unit Total: 1.7640 f(s) Comment: Qty.: Pick: Description Batch Qty Part number 2 D2856-600(Cut to 10.090") Abrasion Strip D28961 17.0 1.0000 Each(s) 1,0000 Each(s)/Unit Total: Comment: Qtv.: Pick: **Description Batch** Qty Part number 1 D2896-1 D31891 18.0 2.0000 Each(s)/Unit Total: Comment: Qty.: 2.0000 Each(s) Pick: Qty Part number **Description Batch** M 08 06 12 Chafing Sheild_ 2 D3189-1

W/O:			WC	RK ORDER CHANG	ES				
DATE	STEP	STEP PROCEDURE CHANGE			Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
									·
Part No	:	PAR #:	Fault Cate	gory:	_ NCR: Yes	No DQ	A:	Date:	
					QA:	N/C Close	d:	Date: _	
NCR:		,	WORK ORDI	R NON-CONFORMA	ANCE (NC	R)			
		Description of NC		Corrective Action Section		Verific	cation	Approval	Approval QC Inspector
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign Date	& Secti		Chief Eng	
									Approval
									Approval

Thursday, 29/05/2008 2:34:14 PM Date: User: Julie Lecocq **Process Sheet** Drawing Name: HIGH AFT X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Part Number: D412664203 Job Number: 39579 Job Number: Description: Seq. #: **Machine Or Operation:** Clamp(per MIL-DTL-8783C) MS2192028 19.0 Comment: Qty.: Total: 4.0000 Each(s) 4.0000 Each(s)/Unit Pick: Qty Part number **Description Batch** Clamp 107502 4 MS21920-28 08 06 12 clamp(per MIL-DTL-8783C) 20.0 MS2192030 Comment: Qty.: Total: 2.0000 Each(s) 2.0000 Each(s)/Unit clamp(per MIL-DTL-8783C) batch: 106810 CROSSTUBES CROSSTUBES RESOURCE 1 21.0 Comment: LANDING GEAR RESOURCE 1 Assemble as per Dwg D412-664-203 1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe 08 06 12 (1) 2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs Batch: 107621 A/R 6398 Magnobond Expiry Date: 08/2009 3-Install clamps as per Dwg D212-664-141. Torque clamps to 80-100 in lb. INSPECT WORK TO CURRENT STEP 22.0 Comment: INSPECT WORK TO CURRENT STEP PACKAGING RESOURCE #1 23.0 Comment: PACKAGING RESOURCE #1 Pick Packing Kit 24.0 AN640A Bolt Comment: Qty.: Total: 4.0000 Each(s) 4.0000 Each(s)/Unit Bolt Batch:

										
W/O:			WC	ORK ORDER CHANG	ES				-	
DATE	STEP	PRO	OCEDURE CHA	NGE	Ву	Da	te Qt	y Approval Chief Eng / Prod Mgr	Approval QC Inspector	
		,								
Part No	:	PAR #:	Fault Cate	gory:	_ NCR: Ye	es No	DQA:	Date: _		
					QA	: N/C C	losed:	Date: _		
NCR:			WORK ORDI	ER NON-CONFORMA	ANCE (N	CR)				
D	0.750	Description of NC		Corrective Action Secti		v	erificatio	n Approval	Approval	
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng		n & ate			Chief Eng	QC Inspector

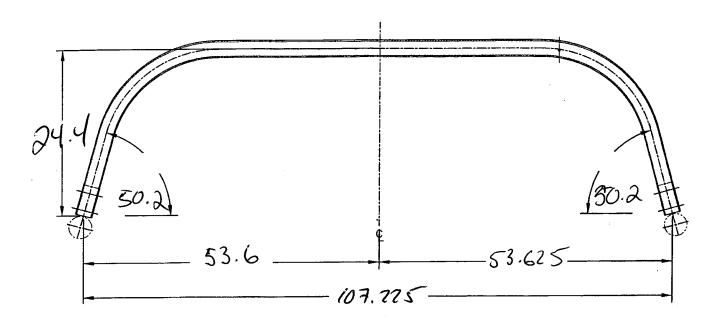
	sday, 29/05/2008 2:34:14 PM	
User: Julie	Lecocq Process Sheet	
Customer:	CU-DAR001 Dart Helicopters Services Drawing Name: HIG	H AFT X-TUBE 412
Job Number:	39579 Part Number: D41	2664203
Job Number:		
Seq. #:	Machine Or Operation: Descrip	tion:
25.0	AN641A Bolt	1 (23 11) (31 1)
Comme	nt: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) Bolt	10
	Batch: ME70B	X> =8/06/17 (XI)
26.0	AN960JD616 Washer	
Comme	nt: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)	\ 0
	Washer Batch: M 16 7242	S oslada @
27.0	MS21042L6 Nut	10 - 36/00/17 (20
Comme		1
	Nut Batch: M105077	83 08/66/17 Ca
28.0	QC4 INSPECT 100% KITS FOR COMPLE	ETENESS 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Comme	nt: INSPECT 100% KITS FOR COMPLETENESS	08/66/17/71
29.0	PACKAGING 1 PACKAGING RESOURCE #1	1188038818818181
Comme	nt: PACKAGING RESOURCE #1	_
	Identify and pack for shipping as per PPP D412-664-203	`.
	******Ensure tube is not packaged if curing time is less than 12 hrs, see ste	p 27 for application time & date
	Time & date of packaging: 08/06/17 (1.15 PM	
	Location:	XSOSKUL CO
30.0	QC21 FINAL INSPECTION/W/O RELEASE	75 5/00/17
		08/06/19dd
Commer	nt: FINAL INSPECTION/W/O RELEASE	' ' '()
Job Completion		u 58.06.18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
Part No	i	PAR #: Fault Category: No	CR: Ye	s No DQ	A:	Date: _	
			QA:	N/C Close	d:	Date: _	

NCR:			WORK ORD	ER NON-CONFORMANO	CE (NCR)				
		Description of NC	Corrective Action Section B		Verification	A			
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Approval Chief Eng	Approval QC Inspector	
						:			
								l .	

DART AEROSPACE LTD	Work Order:	39579
Description: Crosstube High Aft (412)	Part Number:	D412-664-203
Inspection Dwg: D412-664-243 Rev: D		Page 1 of 1

Required Dimension	Min	Max
Height	24.24	24.50
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70



Com	nments
	-
QC15 Inspection	
Date	10B.06.05

Rev	Date	Change	Revised by	Approved
Α	07.02.06	New Issue	KJ/JM	
В	07.05.08	Dimensions updated per Dwg rev. D	KJ/JLM ox	fr
	<u> </u>		· ()-	

W/O:		WORK ORDER CHA	WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approvai QC Inspector	
Part No	•	PAR #: Fault Category:	NCR: Yes	No DO	Δ.	Date	1	

QA: N/C Closed: ____ Date: ____

NCR:			WORK ORDER NON-CONFORMANCE (NCR)						
DATE ST		Description of NC		Corrective Action Section B	Verification	A			
	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector	



DESIG	PH	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA			
CHEC	KED	APPROVED #	DRAWING NO. REV. D D412-664-243 SHEET 1 OF 3			
DATE			TITLE SCALE			
07.0	03.09		CROSSTUBE ASSEMBLY (412 HI AFT) NTS			
A		01.10.17	NEW ISSUE			
В		05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES			
С		06.10.27	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398 MS21920-32 WAS MS21920-30			
D		07.03.09	REMOVE D2732-058, CHANGE TO D3595-063-570			

07.04.24

Qty	Part Number	Description				
Х	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)				
1	D6009-129	CROSSTUBE				
2	D3595-063-570	RUBBER CUSHION				
1	D2896-1	SUPPORT				
2	D2856-600-1009	ABRASION STRIP				
4	MS21920-28	CLAMP				
2	MS21920-30	CLAMP (OR MS21920-32)				
2	D3189-1	CHAFING SHIELD				
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100 TYPE II, CLASS 2 ADHESIVE)				

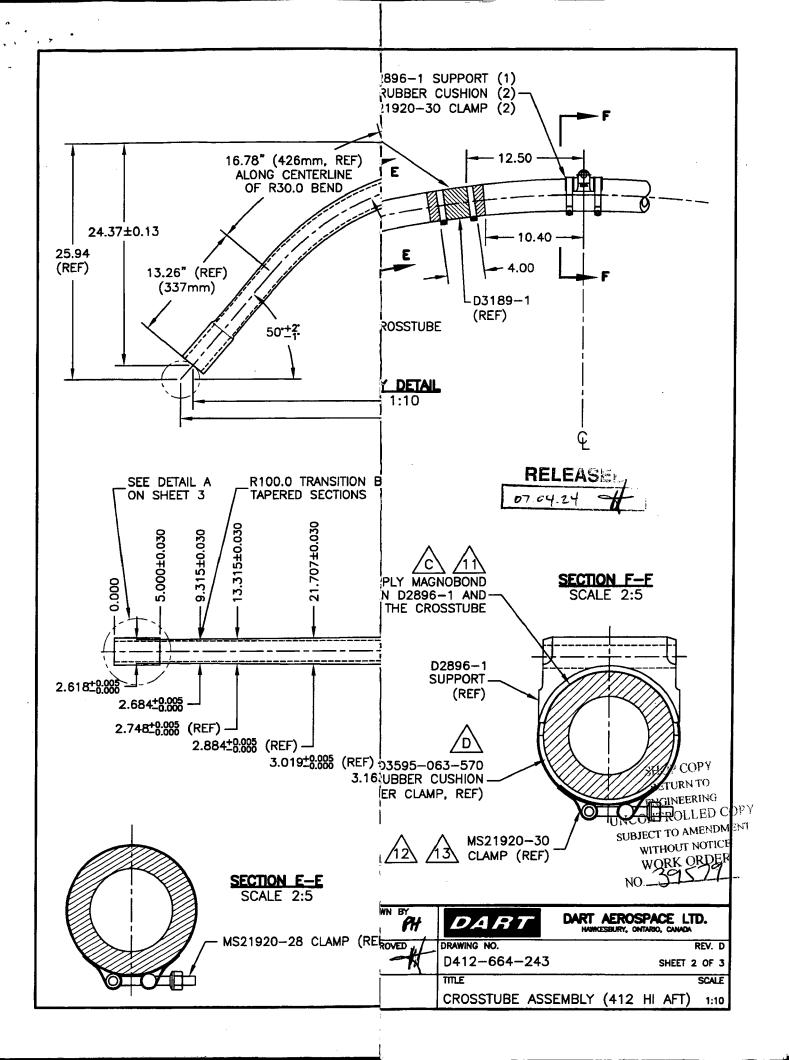
GENERAL NOTES:

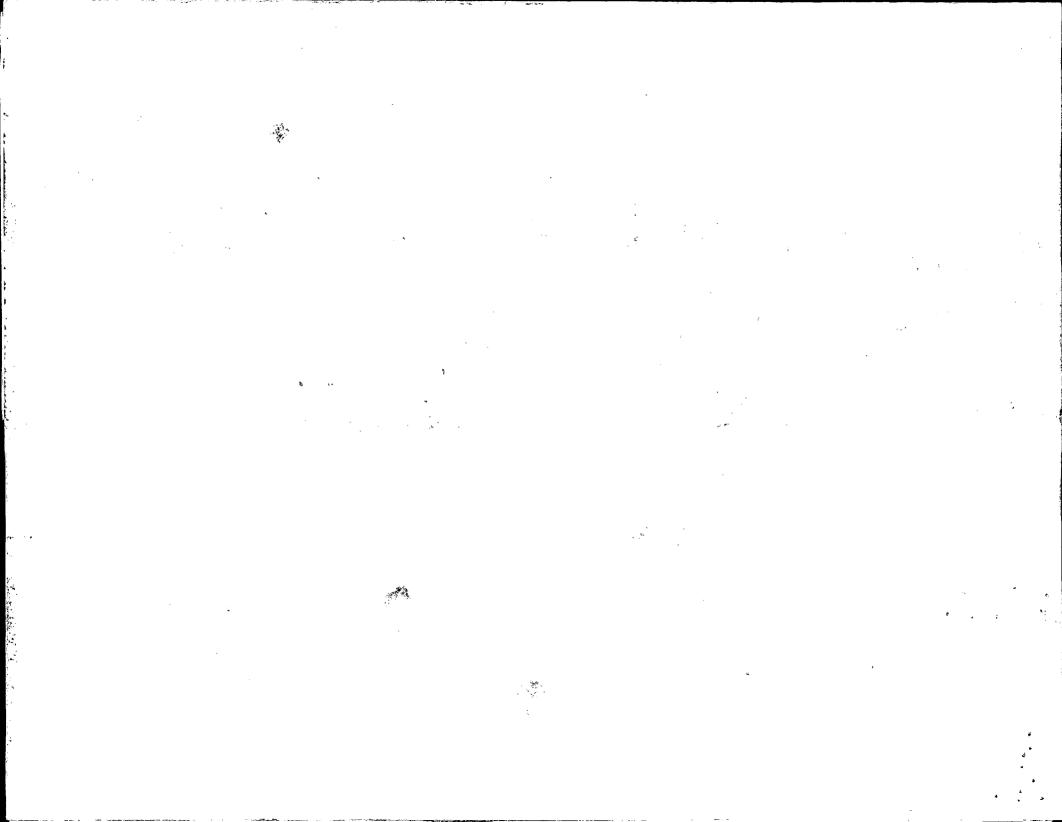
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- MATERIAL: MANUFACTURED FROM D6009-129 FINISHED LENGTH = 124.09±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
- PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING
- INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE **UNACCEPTABLE**
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY RETURN TO ENGINEERING UNCONTROLLED CON SUBJECT TO AMENDMEN WITHOUT NOTICE WORK ORDER

Copyright © 2001 by DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.







LIQUID PENETRANT TEST REPORT

P- 09176

ACUREN	F10				
MCUNEIN				P	AGE OF
<u>~</u>		_		JUNE 09 2008 1	
Ociciti	art Aerospaci	·	DATE	188-08-1354	
7.11 ENTION	JDA LACELLE	<u> </u>	ACUREN JOB NO.	652 5	
VDDKE99	O ABERDEENS		PO/WO No.	HAWKES BURY	
HAL	utesbury, on)	WORK LOCATION	ASTM1417/Q51-038	REV /DATE JMS
	0.45		ACCEPTANCE STD.	משיושין/ורוו ווכת	NOON TO THE PARTY OF THE PARTY
PROJECT	x 203 3x /0	700 20015			
ITEM(S) EXAMINED		<u>780, 38965</u>			
_10	1 - 39274, 397			CAINS IT TO AILO	REV /DATE
JOB DESCRIPTION		LT REV./DATE		ECHNIQUE NO. LT-7504X3	
PART NO. 30CS	D412664203	3	MATERIAL ALO	DINED ALUM! THICK	NESS
SCOPE 2 DCS	Da12664/01			-De Teach IA-O	TITALIAI CLATAT
SCOPE WET	FLOURESCENT	LIQUID PENI	FRANT IN	SPECION 100%	EXTERNAL SURFACE
TEST DETAILS	-				D Door Call Orden
METHOD	FLUORESCENT	☐ VIŞIBLE	WATER WASH	□ SOLVENT REMOV. 317/ □ OUTPUT > 1000 μ	ABLE POST EMULSIFIED W/cm² AMBIENT < 2 fc
FAMILY BRAND		TIME 40-45 MIN.	BLACK LIGHT S/N (FLASHLIGHT TROUBLELIGHT	OUTPUT>100 fc @ SURFACE
PENETRANT REMOVER H	MINIMUM DWELL T MINIMUM DRY TIM		OTHER CA		
DEVELOPER SED 2			LIGHT METER S/N		CAL DUE DATE
	NON AQUEOUS AQUEOU	S DRY			
TEST SURFACE		A MELDED	☐ MACHINED	☐ SHOT BLASTED	CLEAN BARE METAL
SURFACE CONDITION SURFACE TEMPERATURE	, 10 0.100.12	AS WELDED 4°C/ 20°F TO 10°C/50°		☐ 10°C/50°F TO 52°C/125°F	☐ > 52°C/125°F
	METRIC MPERIAL)				
ITEM TEM	COMMENTS	ACCEPT REJECT			
	ENT LIQUID PEN	F. INSP.			
(DEPIFICA	- Ina CY all				
N S S S S S S S S S S S S S S S S S S S		JIY			
EXTERNE	L SURFICE UN	21/	1××××		
2-1902 /-	R # (395-20)204	580 38965			
3pcs 208/10	1 20 722 2017U	100 20 100			
apes 101 #JOB.	# 2141213747		13,23,2		
			$\rightarrow \leftarrow \rightarrow \leftarrow \rightarrow$		
Dec 172	A ADICA DA INC	OF DEFECTS		8/06/10 S	
BEDULIS AV	S INDICATIONS	UI MELEC	$1 \times $	~\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
-T-000 0	TARIT TA CITA	(ISACT			
ITEMS ACCEP	IABLE TO SIAN	-UHNU	1/_/_/		
Scope of Services The agreement of Acuren Group Inc. to	perform services extends only to those serv	ices provided for in writing. Und	er no circumstances shall such based on information and as	h services extend beyond the performance of the sumptions supplied by the owner/operator and	ne requested services. It is expressly understoo l are not intended nor can they be construed as acture, repair and use decisions as a result of i
that all descriptions, comments and exp	ressions of opinion reject the opinions of o	, o go , rano , and ala		plete responsibility for the engineering, manuf in exceed the amount paid for such services.	acture, repair and use decisions as a result of
				performing such services in the same or simil	
In performing the services provided, Ac implied, is made or intended by Acuren	uren Group Inc. uses the degree, care and s Group Inc.	skui orainariiy exercisea unuer sir	c., carrierances by biners	1	
SIGNATURES			1 11	//	
CLIENT REPRESENTATIVE	^	XZ	fre the	DTR#	
	PRINT		SIGNATURE	REPORT	
TECHNICIAN (SIGNATURE):	THE DUANTE		<u> </u>	REVIEWED BY:	JAME INITIALS
NAME (PRINT):	N J RIVIEY		2 ^{NO} TECHNICIAN		IAME INITIALS
	CGSB LEVEL A SNT I	LEVEL CGSB L		EVEL	
	CGSB REG. NO 990/	CGSB R	EG. NO		